THE CALCINATION EFFECT OF Mg-Al-NO_3 LAYERED DOUBLE HYDROXIDE ON REMOVAL OF REACTIVE DYES

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This Final Year Project Report entitled **"The Calcination Effect of $MgAlNO_3$ Layered Double Hydroxide on Removal of Reactive Dyes"** was submitted by Siti Nadiah Binti Zulkafli, in partial fulfillment of the requirement for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

The Calcination Effect of Mg-Al-NO_3 Layered Double Hydroxide in the Removal of Reactive Dyes

Adsorption techniques have been proven to be successful in removal of organic coloured compound in wastewater. Due to this technique, Layered Double Hydroxide (LDH) was newly synthesized as a replacement of activated carbon which is more expensive as well as difficult in the regeneration process. This Mg-Al-NO_3-LDH was synthesized using co-precipitation method and has been calcined in two different temperatures in order to distinguish the adsorption efficiency in both calcinations temperature. The efficiency of calcined LDH (CLDH) was examined in the removal of reactive dyes. Thermogravimetric Analysis (TGA) was used to determine at which temperature the LDH can be calcined. In this experiment, the LDH was calcined at 400 °C and 600 °C. The XRD pattern shows that the intense and sharp peaks of d-spacing at 7.9 Å and interlayer spacing peak at 4.5 Å were destroyed as the LDH was calcined and the regeneration process occur as the adsorption of dyes takes place. The FTIR spectrum shows the disruption of peak as the LDH was calcined and the adsorption has shown to be occur as the functional groups of dyes appear in FTIR spectrum of CLDH. The effect of contact time shows 400 °C of calcinations LDH is more efficient that the CLDH 600 °C in the removal of three reactive dyes. Efficiency of adsorption increase as the contact time increase until it reaches its equilibrium.